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A revision of the Malayan species of *Celastrina* (Lepidoptera: Lycaenidae). By A. Steven Corbet, D.Sc., Ph.D., F.I.C. . . . . pp. 19–34

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# A REVISION OF THE MALAYAN SPECIES OF *CELASTRINA* (LEPIDOPTERA: LYCAENIDAE)

By A. Steven Corbet, D.Sc., Ph.D., F.I.C.

[Read 18th November, 1936.]

With 12 Figures.

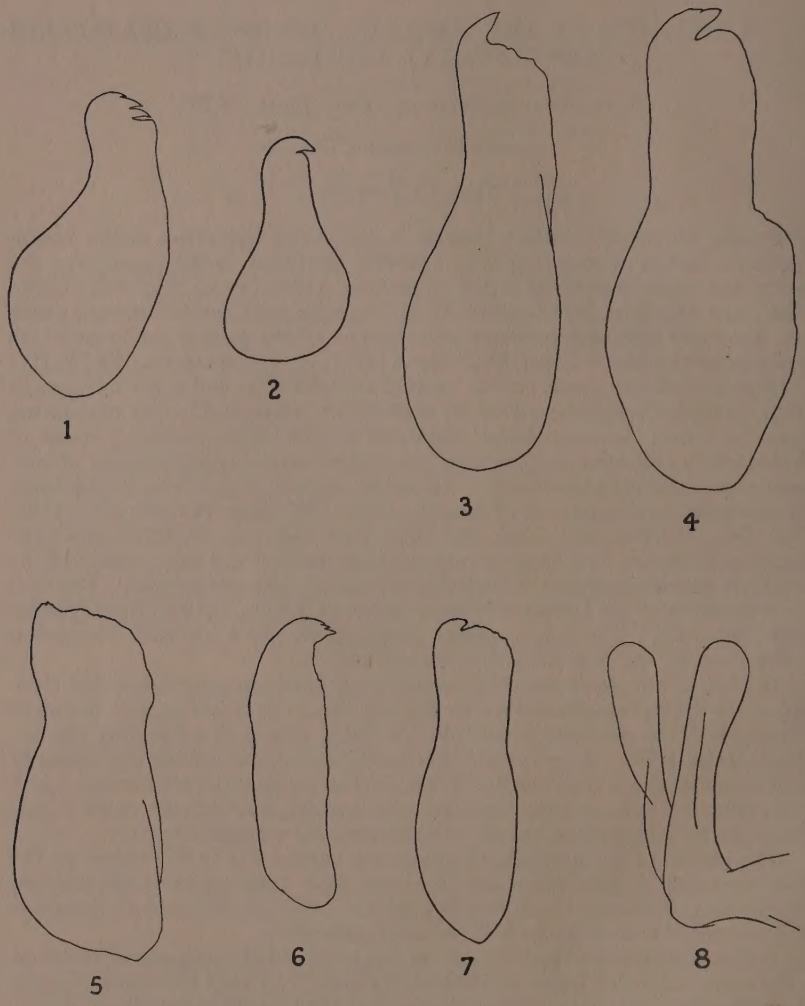
The great similarity between species in the genus *Celastrina* makes identification a matter of some difficulty and this, doubtless, is the reason why the group has been studied so little. Chapman (1909, *Proc. zool. Soc. Lond.*, **1909** : 419–476) first investigated the male genitalia of the *Celastrina* species and his paper contains excellent photographs of the genital armature of all forms known to him. Later, Fruhstorfer (1917, *Arch. Naturgesch.*, **82** (A) (1) : 1–42) examined the genus on the basis of the genitalia, and in his monograph (1922, *in* Seitz, *Grossschmett. Erde*, **9** : 858–877) he succeeded largely in reducing chaos to order; as was almost inevitable at this stage, however, many of Fruhstorfer's collective species were not single entities and a number of subspecies were allocated incorrectly. Recently, important papers on the Javanese Lycaenopsini have appeared (Toxopeus, 1927, *Tijd. Ent.*, **70** : 232–302; 1928, *Tijd. Ent.*, **71** : 179–265; 1935, *Ent. Med. Ned. Indië*, **1** : 68–72) in which the Javanese forms are examined in very thorough fashion and the question of the collective species occurring in Malaysia is considered in some detail. Keys for the separation of the Indian species are given by Evans. (1932, *Ident. Indian Butt.* : 221–225). The Lycaenopsini genera have been revised by myself (1936, *Proc. R. ent. Soc. Lond.* (B), **5** : 185–186).

In view of the great similarity in markings between many species of *Celastrina*, the differences often found in the structure of the male claspers are quite striking and the genitalia constitute a reliable means of separating closely-allied species. The claspers of all Malayan species likely to present any difficulty in determination are shown in figs. 1–10. When present, the androconial scales often differ from one species to another but, usually, these differences are slight, although the wedge-shaped scales of *C. musina* are very distinctive.

The results of the genitalia examinations carried out in the course of the work described in this paper are in accord with those of previous workers, except that Fruhstorfer's description of the male genitalia of *C. moultoni* (Seitz, *Grossschmett. Erde*, **9** : 867) is rather misleading.

With all Malaysian *Celastrina* species, the trend of the geographical variation is the same; Malayan forms are darkest in colour, they have the broadest black bordering, the most generous black dusting and the heaviest underside markings. The Javanese races are much lighter in all respects, having the most extensive white areas and much reduced black bordering. The intermediate Sumatran forms approach more nearly to the Malayan races. Where the forms from East and West Java differ, those from the drier eastern part of the island are lighter.

Although the Bornean *Celastrina* species are by no means as well known as those of the rest of Malaysia, the Bornean representatives of species occurring in Malaya, Sumatra and Java are usually dark and heavily marked much as in the Malayan races.




FIGS. 1–8.—Male clasper of: (1) *Celastrina camenae pendleburyi*, (2) *C. ceyx tanarata*, (3) *C. dilecta briga*, (4) *C. singalensis xanthippe*, (5) *C. placidula irenae*, (6) *C. lavendularis isabella*, (7) *C. pellecebra cyma*, (8) *C. moultoni*.

*Key for the separation of the Malaysian species of* Celastrina.

1 (4). F cell shorter than half length of wing. Both sexes white with black bordering to both wings, only bases blue dusted. ♂ without androconia.

*quadriplaga* group.

2 (3). UnF discal spots broad and prominent: upH distal border at least 2 mm. broad . . . . . *quadriplaga.*

3. UnF discal spots small as usual: upH distal border narrow with distal spots clearly visible. . . . . *nearcha.*

4. F cell as long as, or longer than, half length of wing.

5(14). ♂ F apex very acute and distal border broad, particularly at apex. ♀ with broad costal and distal borders, the latter often continued along basal margin.

*puspa* group.

6(13). UnF discal spots not very broad and not more heavily marked than usual. ♂ without androconia.

7(10). ♂ deep purple above with broad black border, which is regularly defined, on both wings, this border increasing considerably at F apex.

8 (9). Wing expanse under 21 mm. ♂ F costa not broadly black. ♀ F above black with pale blue oval patch whose apical end is rather pointed: veins in discal patch lightly dark dusted . . . . . *moultoni.*

9. Wing expanse above 21 mm. ♂ F with broad black costal border. ♀ above black with a narrow, obscure, greenish-blue discal patch in which veins are heavily dark dusted . . . . . *lenya.*

10. ♂ lustrous blue above. ♀ with prominent pale discal patches and broad costal and distal borders.

11(12). UnH no minute black dot at extreme base of space 7. Un chalky-white. ♀ pale shining blue, with small white discal patches and comparatively narrow F costal and distal borders . . . . . *cossaea.*

12. UnH with minute black dot at extreme base space 7. ♂ lustrous to dull blue. ♀ white, with both wings basally washed with blue and usual broad costal and distal borders . . . . . *puspa.*

13. UnF discal spots very broad and heavily marked. ♂ above lustrous blue with white discal patches; androconia present. ♀ with broad white discal patches, usual broad costal and distal borders, and only extreme wing bases blue dusted . . . . . *carna.*

14. ♂ F apex rounded and apex not broadly black bordered: androconia always present. ♀ with broad costal and distal borders, the latter not continued far along basal margin.

15(31). UnF discal streaks forming a regular curve, not *en échelon.*

16(22). Wing expanse greater than 31 mm.

*corythus* group.

17(18). UnH marginal spots not inwardly defined by a series of submarginal lunules. ♂ up with large white discal patches on both wings. *corythus.*

18(21). UnH marginal spots inwardly defined by submarginal lunules in anal half of wing.

19(20). ♂ upF black distal border a thread and clearly defined . . . . *coalita.*

20. ♂ upF black distal border broader and inwardly diffuse . . . . *idamis.*

21. UnH marginal spots inwardly defined throughout length of distal margin by a series of submarginal lunules. ♂ UpF black distal border broader than *coalita* and clearly defined. ♀ resembles a species of *Deilemera* (ARCTIIDAE) above . . . . . *catreus.*

22. Wing expanse less than 31 mm.

*akasa* group.

23(24). UpF white in both sexes, except for black borders . . . . . *akasa*.
24. UpF blue (lavender-blue in ♀ *camenae*), with or without white discal patch.
25(28). ♂ upF distal border greater than 2 mm. at apex.
26(27). ♂ upH mainly white, with veins dark dusted and distal spots . *aristinus*.
27. ♂ upH white, except for a small blue basal area . . . . *albocaeruleus*.
28. ♂ upF distal border less than 2 mm. at apex.
29(30). UnF discal spots form an evenly curved arc. ♂ upF bright lustrous blue, black distal border increasing noticeably from tornus to apex. ♀ bright blue, with broad costal and distal borders upF . . . *ceyx*.
30. UnF discal spots more or less parallel to distal margin and costal spot shifted inwards and out of line with the rest. ♂ upF dull blue, distal border more uniform, increasing only slightly at apex. ♀ white, washed with lavender-blue, with broad costal and distal borders upF . . . . . *camenae*.
31. UnF discal streaks *en échelon*.
32. Wing expanse less than 24 mm.

*musina* group.

33. ♂ up blue with narrow black bordering; wedge-shaped androconia. ♀ dull blue with broad black bordering . . . . . *musina*.
34. Wing expanse greater than 24 mm.

*singalensis* group.

35(38). Un white, markings rather faint. ♂ upF black distal border a thread.
36(37). ♂ up violet-blue, no pale blue discal patches. ♀ blue with broad costal and distal borders upF. . . . . *singalensis*.
37. ♂ up pale blue, with pale discal patches which may be obsolete. ♀ white, washed with lavender-blue and dark dusted, and with broad costal and distal borders upF. . . . . *dilecta*.
38. Un grey, markings heavier and often edged with white. ♂ with broader black distal border upF.
39(40). ♂ upF distal border inwardly diffuse, less than 2 mm. wide and increasing towards apex. ♀ deep blue comparatively narrow costal and distal borders upF . . . . . *lavendularis*.
40(41). ♂ upF distal border narrower, inwardly rather diffuse and of uniform width throughout: in the Malayan and Sumatran forms the F and H veins are darkened before entering the dark borders. ♀ white, faintly washed with lavender-blue, and with broad costal and distal borders upF . . . . . *placidula*.
41. ♂ upF distal border at least 2 mm. broad, increasing at apex and tornus: above deep purple and usually only extreme base H is blue. ♀ rather pale blue with broad costal and distal borders upF: veins in discal patch F not darkened as in *moultoni*. ♀ un whiter than in ♂ . . . . . *pellecebra*.

### 1. *Celastrina nearcha* Fruh.

*Lycaenopsis quadriplaga nearcha* Fruhstorfer, 1917, *Arch. Naturgesch.*, **82** (A) (1): 38 (♂, N.E. Sumatra).
*L. quadriplaga nearcha* Fruhstorfer, 1922, *Grossschmett. Erde*, **9**: 876, pl. 152 d (8) ♂.

On the basis of differences in the male genitalia, Toxopeus considered that *nearcha* is not conspecific with the Javanese *quadriplaga* Snell. The Javanese species (of which *dohertyi* Tytler is the Burmese race) has broader black bordering and is a much darker butterfly than *nearcha*. The only Malayan male of

*nearcha* in my collection differs from Sumatran specimens in its smaller size, in the fore-wing distal border being more incurved along the basal margin, in the more restricted basal blue dusting and in the more distinct underside markings : it is doubtful, however, if the differences are sufficient to merit subspecific distinction. The Bornean species *boulti* Chapm. (1912, *Ent. mon. Mag.*, (2) 23 : 103*) is closely related, as the figures of the male genitalia show. The male genitalia of Sumatran *nearcha* and Javanese *quadriglapa* have been figured by Fruhstorfer (1917, *loc. cit.*, pl. i, fig. 11) and Toxopeus (1927, *loc. cit.* : 278, fig. 15) respectively.

### 2. *Celastrina moultoni* Chapm.

*Lycaenopsis moultoni* Chapman, 1911, *Trans. ent. Soc. Lond.*, **1911** : 184, pl. xxviii, fig. 5 ♂, 6 ♂ und. (♂ Sarawak, British Museum).
*Lycaenopsis moultoni* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 867, pl. 153 f (7) ♂, (8) ♀.

Of this species, hitherto known only from Borneo, seven males and one female were taken in Selangor (Bukit Kutu, 3485 feet, *A. S. Corbet*) in March 1931. The male can be recognised from the figure in Seitz, but the female is

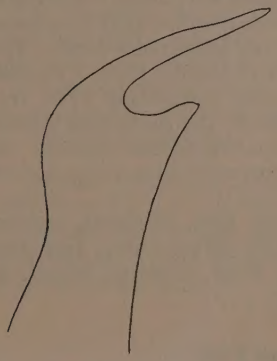


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Fig. 9.—Tip of male clasper *C. puspa lambi.*

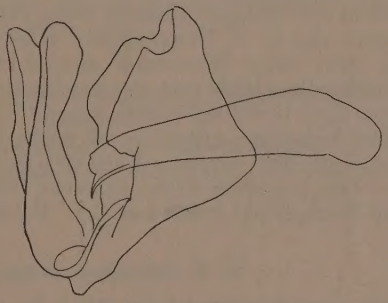

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Fig. 10.—Male genitalia of *C. lenya.*

rather close to *pellecebra* from which it differs, not only in the smaller size, but in that the veins crossing the fore-wing pale discal patch are lightly dark dusted and this pale patch is distally rather pointed.

### 3. *Celastrina lenya* Evans.

*Lycaenopsis chelaka lenya* Evans, 1932, *Ident. Indian Butt.* : 222 (♀ Lenya Valley, South Burma, British Museum).

*C. lenya* is not conspecific with *chelaka* Moult., which pertains to the genus *Lycaenopsis* Feld. & Feld. and is known only from Borneo.

The male of *lenya* resembles the male of *moultoni* above and below but is larger in size (27 mm. against 20 mm.) and the fore-wing apex is less acute : the female is black above and the fore-wing bears a narrow, obscure, greenish-blue discal patch, on which the veins are heavily black dusted.

* This reference is incorrectly given in Seitz, *Grossschmett. Erde*, 9.

A female from peninsular Siam (Khao Ram, 3000 feet, March 1922), in the British Museum from the collection of Brigadier W. H. Evans, has the fore-wing discal streak longer and much paler blue than in the type. In my collection are two males from Bukit Kutu (3485 feet) taken in March 1931, and a female from Tanah Rata (4000 feet) on 1st February 1930 : the last-named does not differ from the type.

The genitalia of the male *lenya* resembles that of *moultoni* and shows a close relationship with that of *Megisba malaya* Hsf.

### 4. *Celastrina puspa lambi* Dist.

*Polyommatus* (*Cyaniris*) *lambi* Distant, 1882, *Ann. Mag. nat. Hist.*, (5) **10** : 245 (Malay Peninsula).
*Cyaniris lambi* Distant, 1884, *Rhop. Malay.* : 211, pl. xxi, fig. 22 ♂.
*Lycaenopsis puspa lambi* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 869.
*L. puspa lambi* Corbet & Pendlebury, 1934, *Butt. Malay. Pen.* : 190, pl. xiii, fig. 173 ♂ und.

This butterfly is generally distributed on the plains in Malaya but occasional examples are taken at altitudes up to 4800 feet. It is very variable and large males with bright lustrous blue upperside, broad black bordering and the hind-wing produced contrast with examples of smaller size, duller colouring and obscure white discal patches on both wings and more rounded hind-wing tornus. The male claspers of extreme forms are identical and intergrades occur : specimens from high altitudes tend to be of the smaller and duller type. A series of males in the Selangor Museum from Pulau Tioman (June–July 1916, *H. C. Robinson* and *C. B. Kloss*) appear to be referable to the subspecies *volumnia* Fruh. (1922, Seitz, *Grossschmett. Erde*, **9** : 870) from the Natuna Islands; they are smaller than *lambi* from the mainland, of a more purple-blue colour and with narrow black bordering to both wings.

The Malaysian subspecies of *puspa* are *lambi* Dist. (Malaya), *mygdonia* Fruh. (Sumatra), *puspinus* Kheil (Nias), *puspa* Hsf. (West Java), *sania* Fruh. (East Java,) *tymbria* Fruh. (Borneo), *volumnia* Fruh. (Natuna Islands and Pulau Tioman) and *vandeldeni* Tox. (Pulau Weh).

### 5. *Celastrina cossaea distanti* Fruh.

*Cyaniris cossaea distanti* Fruhstorfer, 1910, *Stettin. ent. Ztg.*, **71** : 288 (Malay Peninsula).
*Lycaenopsis cossaea distanti* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 867.
*Cyaniris* sp. ?, Distant, 1886, *Rhop. Malay.* : 453, pl. xliv, fig. 10 ♂ nec ♀.

The Malayan race differs but little from the Sumatran *cossaea cossaea* figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 d (3) ♀ and (2) ♀ und. In the Peninsula it is a rare species occurring in open spaces in the forest on the plains and at altitudes up to 3500 feet (Bukit Kutu in my collection).

The Malaysian races are *distanti* Fruh. (Malaya), *cossaea* Nic. (Sumatra), *hegesias* Fruh. (Nias), *sabatina* Fruh. (Java) and *sonchus* Drc. (Borneo). The Bornean *C. plauta* Drc. appears to be a distinct species.

### 6. *Celastrina carna splendens* Btlr.

*Cyaniris splendens* Butler, 1900, *Ann. Mag. nat. Hist.*, (7) **5** : 444 (♂ Larut Hills, Perak, British Museum).
*Lycaenopsis marginata carna* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 874 (partim).
*Lycaenopsis puspa splendens* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 869.

Both Fruhstorfer and Toxopeus incorrectly identified *splendens* as a form of *C. puspa lambi* Dist. The male *splendens* is darker blue and the white areas rather more restricted than in the figured *carna* (Seitz, *Grossschmett. Erde*, **9**

pl. 152 d (7) ♂) from Sumatra. The underside markings, particularly the fore-wing discal band, are darker and more prominent in the Malayan race.

The female has not yet been described.

♀ *Upperside.* Closely resembles the figure of "*contilia*" in Seitz, *Grossschmett. Erde* **9** pl. 152 c (6),* the blue dusting being confined to the wing bases. Differs from the female of the Javanese *carna carnita* Fruh. in the heavier fore-wing basal border and the dark black dusting in the anal half of the hind-wing.

*Underside.* Ground-colour much whiter than in the male. Markings arranged as in that sex, but the spots comprising the fore-wing discal band are smaller and more separated.

Wing expanse 29·5 mm.

Malay Peninsula, Perak, Maxwell's Hill, 3800 feet, 20th September, 1929, *A. S. Corbet.* (*Neoallotype.*)

### 7. **Celastrina corythus toxopeusi** subsp. n.

♂. *Upperside.* Ground-colour more purple-blue, white areas more restricted, broader black bordering to both wings and hind-wing veins more heavily dusted with purple-blue than in nymotypical *corythus* Nic. from north-east Sumatra.

*Underside.* Colour and markings as in *corythus*, but, in the specimen under examination, the discal streaks on the fore-wing are more prominent.

Wing expanse 33·5 mm.

Malay Peninsula, Pahang, Cameron Highlands, Tanah Rata, 4800 feet, 20th May, 1931, *H. M. Pendlebury.* (*Holotype.*)

Hitherto *C. corythus* has been known only from the mountains of Sumatra. It is figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 d (1) ♂. The new subspecies is named after Dr. L. J. Toxopeus.

### 8. *Celastrina coalita margarelon* Fruh.

*Lycaenopsis coalita margarelon* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9**: 866 (North-east Sumatra).

Typical *coalita* Nic. occurs in Java, and the species can now be added to the Malayan list. A male from Pahang, July 1925, in the British Museum (from the collection of Brigadier W. H. Evans) agrees with Sumatran *margarelon* in all respects: in a second male (Pahang, Gunong Batu Brinchang, 5000–5500 feet, 27th March, 1932, *A. S. Corbet*) the underside markings are very prominent and the streaks comprising the fore-wing discal band are much broader and heavier than in the Sumatran form.

The Malaysian races of *coalita* are *margarelon* Fruh. (Malay Peninsula and Sumatra), *polemonia* Tox. (West Java) and *coalita* Nic. (East Java and Bali).

Two rather similar species, *idamis* Fruh, and *catreus* Nic., have not yet been found in the Malay Peninsula. The differences between these three closely allied species are shown in the key. *C. idamis* is confined to Sumatra but *C. catreus* has a wider distribution with the subspecies *gaius* Fruh. (Sumatra), *catreus* Nic. (West Java) and *hermeias* Fruh. (East Java).

* From the original description and the figures in Seitz, **9**, it is evident that *contilia* Fruh., from the Lesser Sunda Islands, is a *carna* subspecies.

9. *Celastrina akasa catullus* Fruh.

*Cyaniris akasa catullus* Fruhstorfer, 1910, *Stettin. ent. Ztg.*, **71** : 283 (Sumatra).
*Lycaenopsis akasa catullus* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 862, pl. 152 c (8) ♂ und., (7) ♀.

The species is often locally common at high altitudes in Malaya and occasional examples are found on the forested foothills. Sumatran specimens are rather larger and the underside markings more distinct than in examples from the Malay Peninsula.

The nymotypical form *akasa akasa* Hsf. occurs in Java.

10. **Celastrina aristinus klossi** subsp. n.

♂. *Upperside.* Differs from typical *aristinus* Fruh. from Java in the much more purple colour and in the much broader black fore-wing border which increases in width from 2 mm. at the tornus to 5 mm. at the apex; on the hind-wing the veins are more prominently dark dusted.

*Underside.* Colour and markings similar to those of the male *aristinus* figured in de Nicéville, 1892, *J. Bombay nat. Hist. Soc.*, **7**, pl. H, fig. 7, ♂ nec ♀, as "*ceyx*."

Wing expanse 31 mm.

Malay Peninsula, Pahang, Pulau Tioman, June–July 1916, *H. C. Robinson & C. B. Kloss.* (*Holotype.*) Erroneously recorded as "*Lycaenopsis corythus*" by Evans, 1933, *J.F.M.S. Mus.*, **17** : 407.

In general appearance *aristinus* resembles the figured Celebean *aristius* Fruh. in Seitz, *Grossschmett. Erde*, **9** pl. 152 e (7) ♂, but the fore-wing has a broader distal band and a white discal patch and the hind-wing veins are dark dusted. Although *aristinus* and *aristius* are similar in appearance and have rather similar male genitalia, Toxopeus regarded them, at least provisionally, as distinct species, a view with which I am in agreement. Apart from the Tioman specimen, *aristinus* is known only from Java, where it is rare. The new subspecies is named after Mr. C. B. Kloss, formerly Director of Museums, S.S. & F.M.S.

11. **Celastrina albocaeruleus scharffi** subsp. n.

♂. *Upperside.* On the fore-wing the white discal area is more restricted and the black distal border about twice as broad as in the Sumatran race *ovianus* Fruh.; the general appearance of the upperside is nearer that of *albocaeruleus* Mre. from North India figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 f (2) ♂.

*Underside.* Markings arranged as in *ovianus* but more distinct.

Wing expanse 26 mm.

Malay Peninsula, Pahang, Fraser's Hill, 4250 feet, 3rd June, 1932, *Dr. J. W. Scharff.* (*Holotype.*)

In another Malayan male (Pahang, Cameron Highlands, Tanah Rata, 4000 feet, 31st January, 1930, *A. S. Corbet*) the fore-wing black distal border is distinctly broader and the wings are longer (wing expanse 27·5 mm.)

A male paratype of *C. ceyx nix* Tox. (East Java, Gunong Lawu, 1400–1800 m., 27th June, 1926, *C. J . F. Denker*) in the British Museum is a male *albocaeruleus*, differing from the Sumatran *ovianus* only in the slightly larger white discal area and rather broader black bordering at the apex on the fore-wing.

At first sight it might be supposed that *dilectissima* Drc. is the Bornean representative of *albocaeruleus*; the genitalia differ so distinctly, however, that it is evident that no very close relationship exists between the two species.

### 12. **Celastrina ceyx tanarata** subsp. n.

♂. *Upperside.* Differs from *C. ceyx elothales* Fruh. from Sumatra in the darker and deeper blue colour of both wings and in the very restricted white apical area of the hind-wing.

*Underside.* Colour and markings as in *elothales.*

Wing expanse 26·5 mm.

Malay Peninsula, Selangor, Bukit Kutu, 3485 feet, 22nd March, 1931, *A. S. Corbet.* (*Holotype.*) Other males from Perak, Larut Hills; Selangor, Bukit Kutu (3485 feet); Pahang, Fraser's Hill (4250 feet) and Cameron Highlands (4000 feet).

♀. *Upperside.* Both wings dull purple-blue, appearing pale lustrous blue by reflected light. *Fore-wing*: broad black costal and distal borders, the former increasing in width towards the apex and inwardly diffuse. Distal border 1·5 mm. at narrowest part, increasing in width towards apex and tornus; inwardly very diffuse and veins darkened a short distance before entering the distal border. The wing base lightly black dusted, a cell-end streak faintly visible, and an almost obsolete white discal spot. Cilia black, becoming white at tornus. *Hind-wing*: a black costal border extending to vein 6; a black, inwardly diffuse, distal border (about 1 mm. broad) on which interneural dark spots are faintly visible. Wing base lightly black dusted and indications of a white discal area. A dark costal spot in space 7 showing through from beneath. Cilia white, becoming black at tornus.

*Underside.* Ground-colour whiter than in male; markings similar but rather smaller.

Wing expanse 24 mm.

Malay Peninsula, Selangor, Bukit Kutu, 3485 feet, 14th March, 1931, *A. S. Corbet.* (*Allotype.*) Other females examined from Pahang, Cameron Highlands and Fraser's Hill.

The female *tanarata* differs from the female *ceyx ceyx* from West Java in the much darker colouring and broader bordering above (particularly in the black dusting on the hind-wing): the males of *ceyx* become progressively whiter on proceeding from Malaya, through Sumatra, to West and East Java. The upperside and underside of the Bornean *ceyx selma* Drc. is figured in Seitz, *Grossschmett. Erde*, 9 pl. 154 c (3) ♂. In addition to the Malaysian subspecies mentioned above, *ceyx nix* Toxopeus occurs in East Java.

### **Celastrina ceyx cerima** subsp. n.

A male from Dawnas, Burma (November 1921), in the British Museum from the collection of Brigadier W. H. Evans, differs from the Malayan race in the broader fore-wing distal border and in the more prominent white subapical patch on the hind-wing (wing expanse 30 mm.). I name it *cerima* subsp. n.

### 13. **Celastrina camenae pendleburyi** subsp. n.

*Cyaniris camenae* de Nicéville, 1895, *J. Bombay nat. Hist. Soc.*, **9**: 278 (partim).
*Lycaenopsis camenae camenae* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9**: 863, pl. 152 g (3) ♂ as "*camenae.*"
*Lycaenopsis carna* Corbet & Pendlebury, 1934, *Butt. Malay. Pen.*, pl. xiii, fig. 172 ♂ und.

♂. Differs from typical *camenae* from North-east Sumatra only in the more restricted and less prominent white area in the costal area of the hind-wing above.

Wing expanse 28 m.

Malay Peninsula, Perak, Maxwell's Hill, 4500 feet, 16th September, 1929, *A. S. Corbet.* (*Holotype.*)

♀. *Upperside.* In general appearance resembles the female *camenae* from Sumatra figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 g (4), but the ground-colour is a rich lavender-blue, the fore-wing black bordering is broader and slightly curved inwards at the tornus, and the hind-wing is dark dusted rather broadly along the costal and distal margins. Both wings have prominent pale discal patches and cell-end spots are visible as in *camenae camenae.*

*Underside.* Colour and markings exactly as in male.

Wing expanse 26 mm.

Malay Peninsula, Perak, Maxwell's Hill, 3800 feet, 16th September, 1929, *A. S. Corbet.* (*Allotype.*) Other females examined from Perak, Larut Hills; Pahang, Fraser's Hill (4250 feet) and Gunong Tahan (5500 feet).

I wish to associate the name of this new *camenae* race with that of Mr. H. M. Pendlebury.

Fruhstorfer considered the Malay Peninsula as the type locality of *camenae* and described *elothales* as the Sumatran race; the male holotype of this latter form is in the British Museum and is conspecific with *ceyx* Nic. Toxopeus regarded Sumatra as the type locality of *camenae* and stated that *cossa* Chapm. (1909, *Proc. zool. Soc. Lond.* **1909 :** 453) was a name available for the Malayan race, if differing from Sumatran *camenae*. The male holotype of *cossa* in the British Museum originated from Sumatra and not the Malay Peninsula, as Toxopeus supposed. I have ascertained that the male type of *camenae* in the Indian Museum, Calcutta, is labelled " Cyaniris camenae de Nicéville, ♂ Type, Sumatra, No. 15639 (Coll. de Nicév.)," so that *cossa* Chapm. sinks as a synonym of *camenae.*

Toxopeus stated that no females of *camenae* were known, but there can be no reasonable doubt that the " *camenae* " figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 g (4), and of which the original is stated by Toxopeus to be in the Munich Museum, is, in fact, a female of the Sumatran *camenae camenae.* Toxopeus regarded this female specimen, and probably correctly, as the female type of *elothales* Fruh., but the holotype of *elothales* is a male and not conspecific with the female figured on plate 152 as " *camenae.*"

*C. camenae* and *C. ceyx* are very similar in the male (the females differ considerably) and have been confused repeatedly in the literature. Above, the male *camenae* is a rather dull blue, the narrow black distal border almost uniformly broad on both wings and the discal spots show through from beneath. The upperside of the Malayan *ceyx* is bright lustrous blue, the fore-wing black border considerably broader than that of the hind-wing and increasing markedly towards the apex; the underside markings do not show through. In both species the markings of the underside are very similar and a little variable : while in *ceyx* the fore-wing discal series of spots are apically bent inwards and form a regular curve, in *camenae* these spots remain more or less parallel to the wing margin and the costal spot is always out of line with the others. In *camenae* there is a tendency for the discal spots to be placed *en échelon* while they are always straight in *ceyx.*

In Borneo occurs a dark race, *C. camenae strophis* Drc., of which the female appears to be unknown. The figure in Seitz, *Grossschmett. Erde*, **9** pl. 154 c (2) ♂, is reasonably accurate.

### 14. *Celastrina musina candaules* Nic.

*Cyaniris candaules* de Nicéville, 1895, *J. Bombay nat. Hist. Soc.*, **9** : 276 (♂ Sumatra, Indian Museum, Calcutta).
*Lycaenopsis musina candaules* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 876, pl. 152 h (2) ♀ as "*musina*."

The male *candaules* is much like the Javanese *musina musina* figured in Seitz, *Grossschmett Erde*, **9** pl. 152 h (1). The long, wedge-shaped androconia on the wings of the males admit of the ready separation of *musina* from all other Malaysian *Celastrina*. Males of *musina musinoides* Swinh. from Assam and

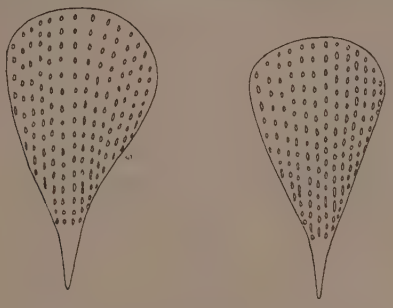

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Fig. 11.—Androconial scales of *C. musina candaules*.

Burma differ from *musina candaules* in the appreciably broader black bordering on both wings : *parishii* Rhé Phil. (described from Assam) falls as a synonym of *musinoides* Swinh. I have seen no females of *candaules* from Sumatra, but should these differ from Malayan examples, a new name must be found for the Malayan race.

In the Peninsula the species is confined to the forested hills.

The other Malaysian races are *musina* Snell. (Java) and *lugra* Drc. (Borneo).

### 15. **Celastrina singalensis xanthippe** subsp. n.

This species has not been hitherto recorded definitely from the Malay Peninsula. In Malaysia, the males of *singalensis* and *dilecta* are deceptively alike but they can always be separated from the appearance of the upperside : in *singalensis* the wings are uniformly coloured a rather rich violet-blue and there is no suggestion of a white discal area on either wing; in *dilecta* the wings are more purple and rather paler and almost always there are at least indications of white discal patches on both wings. A male *singalensis* could hardly be passed over in a series of males of *dilecta*. Often the underside of *singalensis* is distinctive in the mat surface with reddish-brown markings, but these characters grade into the usual *dilecta* markings : as far as the Ceylon and Malaysian forms of *singalensis* are concerned, there is a distinct tendency for the fore-wing submarginal strigae to consist of a series of straight streaks, and not to be lunulate as in *dilecta*, and for the more distal costal spot on the hind-wing to be streak-like instead of circular. The females of *singalensis* and *dilecta* are quite distinct.

♂ *Upperside.* Closely resembles the male holotype of *C. singalensis catius* Fruh. from Sumatra, but the hind-wing border is more prominent.

*Underside.* Colour and markings similar to *catius* but the markings are broader and rather more diffuse. Both upperside and underside hardly differ from typical *singalensis* Feld. from Ceylon.

Wing expanse 36 mm.

Malay Peninsula, Pahang, Cameron Highlands, Rhododendron Hill, 5200 feet, 22nd June, 1923, *H. M. Pendlebury.* (*Holotype.*)

A smaller male in my collection (Selangor-Pahang, Semangko Pass, 2800 feet, 19th February, 1929, *A. S. Corbet*) corresponds closely to the male holotype of *singalensis astarga* Fruh. from Java and the underside has a glistening surface and resembles the "*singalensis*" figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 f (6) ♂ und. The genitalia of the two males are identical and the clasper of the Semangko Pass specimen is figured.

♀. *Upperside.* Deep purple-blue with the fore-wing black costal and distal borders broader than in typical *singalensis* from Ceylon; the hind-wing pale discal patch almost obsolete. The fore-wing black distal border is not continued for a short distance along the basal margin as in the female *astarga* (Toxopeus, 1928, *loc. cit.*, pl. v, fig. 11).

*Underside.* Colour and markings as in typical *singalensis.*

Wing expanse 31 mm.

Malay Peninsula, Pahang, Cameron Highlands, Rhododendron Hill, 5200 feet, 13th October, 1923, *H. M. Pendlebury.* (*Allotype.*)

### 16. *Celastrina dilecta briga* Fruh.

*Lycaenopsis cardia briga* Fruhstorfer, 1917, *Arch. Naturgesch.*, **82** (A) (1) : 15 (♂ Perak).
*Lycaenopsis cardia briga* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 865.

The type of *briga* is Chapman's aedeotype of Malayan *dilecta* Mre.

The males exhibit some variability in the extent and intensity of the white discal patches on the upperside; these areas may be almost obsolete, or large and prominent, as in an example in my collection from Gunong Batu Brinchang

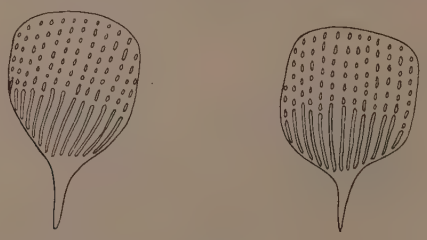

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Fig. 12.—Androconial scales of *C. dilecta briga.*

(5000–5500 feet, 27th March, 1932, *A. S. Corbet*). The underside markings are arranged as in "*thoria*" figured in Seitz, *Grossschmett. Erde*, **9** pl. 152 g (1) ♂ und.

The male of the Sumatran *C. dilecta neodilecta* Fruh. hardly differs from *briga* except that the underside markings may be rather more prominent and edged with white, as in *C. placidula intensa* Tox.

The female of *briga* has not been described.

♀. *Upperside.* Resembles the figure of "*thoria*" ♀ in Seitz, *Grossschmett. Erde*, **9** pl. 152 f (8) in general appearance, but the ground-colour is a more lavender-blue and the fore-wing distal black border is broader. Differs from the Javanese *C. dilecta paradilecta* Fruh. in the heavier black dusting, particularly on the hind-wing.

*Underside.* Whiter than in the male; markings identical.

Wing expanse 24 mm.

Malay Peninsula, Selangor-Pahang border, Ginting Simpah, 2080 feet, 6th April, 1930, *A. S. Corbet.* (*Neoallotype.*)

Although *C. dilecta briga* is a montane insect, occasional specimens are taken on the forested plains.

The Malaysian forms of *C. dilecta* are *briga* Fruh. (Malaya), *neodilecta* Fruh. (Sumatra), *paradilecta* Fruh. with f. *phoenix* Tox. and ab. *bruggemani* Tox. (West Java), *subcoalita* Rothsch. with ab. *dammermanni* Tox. (East Java), and *paracatius* Fruh. (Borneo). Typical *dilecta* Mre. from Nepal.

### 17. **Celastrina lavendularis isabella** subsp. n.

*Cyaniris placida* Distant, 1886, *Rhop. Malay.* : 453, pl. xliv, fig. 7 ♂.
*Lycaenopsis limbata placida* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 872 (partim).

♂. *Upperside.* Deep blue with rather broad, inwardly diffuse, black borders to both wings, these borders increasing in width towards the apexes, as in typical *placida* Nic. from Sikkim. Differs from *placidina* Fruh. from North-east Sumatra (*not* figured as "*placida*" in Seitz, *Grossschmett. Erde*, **9** pl. 152 f (5) ♂ und., which represents *C. placidula intensa* Tox.) in the rather darker colouring and broader bordering to both wings.

*Underside.* Markings identical with typical *placida* from Sikkim and *placidina* from Sumatra, but the ground-colour appreciably greyer and darker than in either of these subspecies.

Wing expanse 28·5 mm.

Malay Peninsula, Perak, Maxwell's Hill, 3800 feet, 9th September, 1929, *A. S. Corbet.* (*Holotype.*)

Some males of *isabella* are deceptively like that sex of *C. puspalambi*, but the presence of androconia and the absence of a minute black spot at the extreme base of space 7 on the hind-wing beneath in the first-named affords a ready means of separating the two.

♀. *Upperside.* Ground-colour a deep lavender-blue, increasing in intensity towards the wing bases, instead of white with blue-dusted basal thirds as in *placida* from Sikkim. Fore-wing with broad black costal and distal borders, the latter being incurved at the tornus; a dark streak at the cell-end, and the basal margin narrowly black dusted. Hind-wing with a black costal border extending to vein 6 and a distal border comprising a black marginal thread, a series of black interneural spots (hardly increasing in size from tornus to apex) inwardly edged with white, and an inner black sinuate line. On both wings the veins are black dusted in the discal area. Cilia on both wings dirty white.

*Underside.* Ground-colour whiter than in the male; markings identical.

Wing expanse 25·5 mm.

Malay Peninsula, Pahang, Fraser's Hill, 4250 feet, 1st June, 1932, *A. S. Corbet.* (*Allotype.*)

The male of *floresiana* Courv.* from Java differs from the subspecies from

* *floresiana* Courv. = *limbatus pellax* Fruh. Fruhstorfer first described *Cyaniris placida pellax* (1910, *Stettin. ent. Ztg.*, **71** : 292) from a male *Rhinelephas* which he mistook for a female. Later, he associated a male *lavendularis* from Lombok with this supposed Javanese female under the name of *Lycaenopsis limbatus pellax* (1917, *Arch. Naturgesch.*, **82** (A) (1) : 31).

Malaya and Sumatra by the brighter colouring, narrower black bordering and much diminished black spotting on the hind-wing distal margin. The male of *hegesander* Fruh. from Tonkin resembles *isabella* but the black bordering is hardly more than half as wide.

### 18. **Celastrina placidula irenae** subsp. n.

*Lycaenopsis limbata placidina* Fruhstorfer, 1922, Seitz, *Grossschmett. Erde*, **9** : 873 (partim). The figure on pl. 152 f (5) ♂ und. as "*placida*" is a good representation of the Malayan or Sumatran male.
*Celastrina placidula intensa* Toxopeus, 1928, *Tijd. Ent.*, **71** : 241 (partim).

♂. Differs from *C. placidula intensa* from Sumatra only in that the underside markings are slightly heavier and the costal spot in space 7 on the hind-wing is somewhat larger.
Wing expanse 29 mm.

Malay Peninsula, Pahang, Fraser's Hill, 4250 feet, 3rd June, 1932, *Dr. J. W. Scharff*. (*Holotype.*)

Malayan and Sumatran *placidula* males differ from other *Celastrina* species in the darkened veins in the distal part of the hind-wing.

♀. *Upperside.* Ground-colour white with the basal half of the fore-wing and the basal two-thirds of the hind-wing pale lavender-blue. The fore-wing costal and distal black borders are broader than in ♀ *intensa* from Sumatra (Toxopeus, 1935, *Ent. Med. Ned.-Indië*, **1** : 71, pl. vi, fig. 1) and the basal margin is black dusted. Hind-wing with distal bordering broader than in *intensa* and anal and basal parts of the wing lightly black dusted. On both wings the veins are lightly dark dusted.
*Underside.* Ground-colour much whiter than in the male. Markings identical but not fringed with white as in the male.
Wing expanse 27 mm.

Malay Peninsula, Selangor, Bukit Kutu, 3485 feet, 9th March, 1931. *A. S. Corbet.* (*Allotype.*)

Both sexes of *C. placidula irenae* differ from *C. placidula snelleni* Tox. from Java in the darker colouring and broader bordering of the upperside. Typical *placidula* Drc. (1875, *Proc. zool. Soc. Lond.*, **1875** : 572) * flies in Borneo : in the figure in Seitz, *Grossschmett. Erde*, **9** pl. 154 b (6) ♂, the upperside is correct but the underside ground-colour is too white and the markings too regular.
The new subspecies is named after my wife.

### 19. *Celastrina pellecebra cyma* Tox.

*Celastrina cyma* Toxopeus, 1927, *Tijd. Ent.*, **70** : 272 (♂ Malay Peninsula).
*Cyaniris jynteana* var. Distant, 1886, *Rhop. Malay.* : 452, pl. xliv, fig. 6 ♂.
*Lycaenopsis melaena melaena* Fruhstorfer (*nec* Doherty), 1922, Seitz, *Grossschmett. Erde*, **9** : 862, pl. 152 g (7) ♂.

Fruhstorfer described *Cyaniris pellecebra* (1910, *Stettin. ent. Ztg.*, **71** : 296) from Sumatra, and the female holotype and male allotype are in the British Museum. The male closely resembles and is clearly conspecific with *cyma* Tox., from Malaya. The female is certainly not a *puspa* form, as Toxopeus supposed, and there is no reason for doubting that the male and female are correctly paired.

Although Sumatran *pellecebra* and Malayan *cyma* hardly differ, it seems advisable to allow the latter name to stand. In the Joicey collection, in the

* This reference is incorrectly given in Seitz, *Grossschmett. Erde*, **9**.

British Museum, is a male from Mount Matang (3000 feet), Sarawak, which is perhaps nearer to *cyma* than to *pellecebra*.

In the male of the collective species, the hind-wing border can be comparatively narrow, as in the ♂ "*melaena*" figured in Seitz, or so broad as to cover almost the whole of the wing. The genitalia of the two forms are identical.

The male of *pellecebra* differs from *moultoni* and *lenya*, not only in the much more rounded fore-wing apex, but in that the fore-wing black distal border is incurved along the basal margin.

The female of *C. pellecebra cyma* has not yet been described.

♀. *Upperside.* Differs from ♀ *pellecebra* (Seitz, *Grossschmett. Erde*, **9** pl. 152 g (8)) in the somewhat broader fore-wing costal border and in the more extended blue dusting on the pale discal patch.

*Underside.* Ground-colour much whiter than in the male and with very little reddish dusting. Markings narrower and finer than in the male and, on the hind-wing, the inner black costal spot in space 7 and the inner black spot along the basal margin are absent.

Wing expanse 23·5 mm.

Malay Peninsula, Selangor-Pahang, Ginting Simpah, 2080 feet, 3rd June, 1929, *A. S. Corbet.* (*Neoallotype.*)

Two Selangor Museum females, from Bukit Kutu (3300–3500 feet) and Fraser's Hill (4000 feet) respectively, differ only in the longer fore-wings (wing expanse 29–30 mm.).

In addition to the forms dealt with above, the following species of *Celastrina* occur in Borneo : *lingga* Moult., *boulti* Chapm. (1912, *Ent. mon. Mag.*, (2) **23** : 103 *), *plauta* Drc., *shelfordi* Nic. (= *armeta* Fruh.), *ripte* Drc., *nigerrimus* Moult. and *dilectissima* Drc. As yet, none of these species has been found outside Borneo.

During the course of the work the following British Museum types have been examined : *akasa* Hsf., *albocaeruleus* Mre., *astarga* Fruh., *boulti* Chapm., *catius* Fruh., *cossa* Chapm., *dilecta* Mre., *elothales* Fruh., *hegesander* Fruh., *idamis* Fruh., *lenya* Evans, *limbata* Mre., *lingga* Moult., *marginata* Mre., *moultoni* Chapm., *musinoides* Swinh., *neodilecta* Fruh., *nigerrimus* Moult., *ovianus* Moult., *paracatius* Fruh., *parishii* Rhé Phil., *limbatus pellax* Fruh., *pellecebra* Fruh., *placidina* Fruh., and *splendens* Btlr., and *cardia* Feld. has been examined at Tring. Two paratypes in the British Museum are *nix* Tox. and *snelleni* Tox. The types of *briga* Fruh. and *cyma* Tox. should be in the British Museum but cannot be found. Of the new subspecies described in the present paper, the types of *klossi*, *toxopeusi* and *xanthippe* are in the Selangor Museum, that of *cerima* is in the British Museum, and the remainder are in my own collection but all holotypes will be assigned to the National collection.

I am indebted to the authorities of the British Museum (Natural History) for granting facilities for the study of their collections, to Lord Rothschild for permission to examine certain types at Tring, and to Mr. H. M. Pendlebury for the loan of specimens from the rich collections in the Selangor Museum. Again I have pleasure in acknowledging indebtedness to Brigadier W. H. Evans, C.S.I., C.I.E., D.S.O., for help and constructive criticism.

* This reference is incorrectly given in Seitz, *Grossschmett. Erde*, **9**.